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# PLASTIC PACKAGING: A CURRENT PERSPECTIVE ON SUSTAINABILITY

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## Abstract

Packaging producers, machine manufacturers, and/or resin manufacturers are studied to conduct case study research to assess the issues they are facing with regard to “sustainability”. This industry viewpoint is conducted to generate information regarding environmental pressures facing these companies and the resulting strategies employed to be competitive and sustainable. To collect the necessary information about these selected companies and the overall industry point of view they represent, direct interview techniques are used.

## Introduction

“Then I say the earth belongs to each generation during its course fully and in its own right. The second generation receives it clear of the debts and encumbrances, the third of the second, and so on...Then, no generation can contract debts greater than may be paid during the course of its own existence.” – *Thomas Jefferson* (1)

The United States is in the midst of one of the greatest periods of upheaval in our history. Our scientists, engineers and businesses, in general, face a broad array of challenges in areas ranging from energy and water resource issues to global environmental concerns to our competitiveness in the world economy and our effectiveness as a source of innovation. How we respond to these challenges will define much about our nation and its place in the world for decades to come.

## Sustainability

What is ‘sustainability’? Thomas Jefferson, in 1789, is credited with the first definition of sustainability as shown above. We can restate Jefferson’s quote as ‘Our generation must meet the needs of the present without compromising the ability of future generations to meet their own needs’ (2).

In this context ‘sustainability’ can be related to many facets of our society, such as natural resources and built materials, energy and environmental impact, water resources and related human health, or business/governmental activities and finite economic

resources. In many cases, the word ‘sustainability’ is misused and not related to the specific societal activities. While ‘sustainability’ is irreverently tossed around in today’s media, education and workplace, many others focus on the core aspects of sustainability: mass balance and energy balance fundamentals and life cycle analysis. These core aspects of sustainability can be used to reduce almost any process to the critical elements that limit its sustainability be it a manufacturing setting, the protection and preservation of water resources, or evaluating energy profiles for a municipality. Then the components of the problem can be addressed with ‘sustainability’ being tied appropriately to finite nature of energy, natural resources, or financial responsibility (3).

Challenges related to the environment, have been expanding for a number of years. For example, issues with energy management, alternative energy (economical solar and wind power, efficient fuel cells, affordable disposal of nuclear waste); water (safe drinking water, hazardous chemical contamination, falling water tables); and materials (materials recovery; less is more packaging, green building materials) are but a few of the many interdisciplinary problems that need to be addressed for sustainability (4).

## The Plastics Industry and Sustainability

The United States plastics industry is a multi-billion dollar business, and it is still growing at a rate faster than most other industries in this country. According to Society of Plastics Engineers, over 200 million tons of plastic are manufactured annually around the world. Of those 200 million tons, 26 million are manufactured in the United States. The U.S. Environmental Protection Agency (EPA) reported in 2003 that only 5.8% of those 26 million tons of plastic waste are recycled. From 1960 to 2007, the amount of plastic flowing to U.S.’s municipal solid waste (MSW) stream has increased from less than 1 percent of total solid waste to 12.1 percent. In 2007, 14 million tons of plastics (mostly containers and packaging) were added for a total of 31 million tons in the MSW (5).

American Chemistry Council (ACC) released the 2010 resin production and sales statistics in July 2010. According to these statistics, U.S. production of major plastic resins totaled 6.5 billion pounds during July 2010, an increase of 1.8 percent compared to the same month in

2009. Year-to-date production was 44.0 billion pounds, a 4.9 percent increase compared to the same period in 2009 (6). Sales and captive (internal) use of major plastic resins totaled 6.6 billion pounds during July 2010, an increase of 6.9 percent from the same month one year earlier. Year-to-date sales and captive use was 43.4 billion pounds, a 3.3 percent increase compared to the same period in 2009 (7).

About ten years ago, the American Plastics Council, now part of the American Chemistry Council, spent several million dollars on a television and print advertising campaign named "Plastics Make it Happen". The focus of the ad campaign was to change the minds of skeptical and ill-informed members of the public concerning the benefits of plastics and defuse the rhetoric and the voodoo science claims (8). Financing for "Plastics Makes it Happen" came from chemical and resin companies and was considered extremely successful as monitored by the reduction in anti plastic voices at the time (9). The plastic industry has been continuously criticized by the environmentalists and other concerned parties for pollution, litter, toxic matters, and energy consumption. Due to these pressures and the growth of plastics in the global community, plastic companies are being more cautious about environmental issues. This has resulted increased recycling, the use of bio-plastics, biodegradable plastics, and other alternative resources and materials.

Sustainability is the goal of sustaining economic growth while maintaining natural ecosystems and assuring the equitable distribution of goods and services (10). Sustainability aims for two things: first, an ongoing and stable resource base that does not deplete, and may even expand, natural resources or ecosystem and, second, an ongoing and stable social system that creates or preserves just standards of living and security of all (11). Sustainability has been an increasingly urgent agenda item for many businesses, whether connected to the plastics industry or not. Indeed, more and more corporations are publishing annual sustainability reports, creating new positions such as the chief sustainability officer, developing new products with labels like "green", "fair-trade", and "organic". According to survey conducted in 2005, 87% of the fortune 1000 CEOs believe sustainability is important to a company's profits, while 89% believed sustainability will be a significant issue in the next three year (12).

The sustainability arena offers an unprecedented opportunity for the plastics industry, if approached with creative and forward thinking, said Dr. Seetha Coleman-Kammula of Simply Sustain LLC, in her Conference presentation titled "Resource Productivity and Sustainable Growth" (13). A consumer products giant, Procter & Gamble Company (P&G), has announced a

sweeping sustainability effort - one likely to have far-reaching impact on the plastics industry. Bob MacDonald, P&G chairman, president, and CEO, said, "What is important is that we don't treat environmental sustainability as different from our base business. When we operate sustainably, we earn gratitude, admiration and trust that lead to opportunity, partnerships and growth" (14).

Today, sustainability has become the focal point to deliver evidence of a firm's commitment to the triple bottom line (economic, social, and environmental responsibilities). This has not been an easy transition and required a different way to evaluate and communicate corporate responsibility. Some of the motivations underlying the corporate sustainability concept include competitive advantage, profitability, increasing stakeholder pressure, legal requirements, reputation concerns, environmental performance and internal organization improvements similar to innovation advantages (15). It has long been recognized that sustainability is an innovative and potentially transformational force that generates new products and processes that challenge existing practice (16). Here, sustainable innovations are defined as innovations in which the renewal or improvement of products, services, technological or organizational processes not only delivers an improved economical performance, but also an enhanced environmental and social performance, both in the short and long term (17). It integrates stakeholder demands into decision-making and aims at a transformational change of existing practice. The integration of economic, social, and environmental aspects sets sustainable innovations apart from conventional innovations: not every innovation is sustainable (18).

## Methodology

A series of questions were prepared to interview attendees at the Sustainable Plastic Packaging 2010 Conference held in Atlanta, GA. The December 2010 conference was sponsored by *Plastics News*. Many of the companies attending the conference were participants in the plastics packaging supply chain. Some of the companies were interviewed in person during the conference. The second phase of this study will include e-mailed surveys and interviews by telephone. A total of sixteen companies were interviewed and among them are the five selected for review in this paper: ClearLam Packaging, Amcor Rigid Plastic Packaging, Klockner Pentaplast, Plastics Technologies and Airlite Plastics.

The objective of the questionnaires was to determine if and how "sustainability" was a factor in their businesses. What types of solutions and systems were they implementing for customer projects and how were they training their personnel in "sustainability". A secondary

objective was to confirm the increasing emphasis and importance of “sustainability” in their own business enterprise. By interviewing these companies, we hoped to gain a clearer understanding of the way companies are interpreting “sustainability” and developing best practices. Table 1 displays the questions and responses from the interviews. Responses are anonymous.

### Conclusions

The results of the interviews, Table 1, clearly underscored our hypothesis that sustainability and environmental responsibility are becoming more important elements of company strategy in the packaging industry. There are varied interpretations of what the implementation of sustainable practices means, but there is a general consensus that it needs to be in the forefront of company strategy going forward.

Most of the companies interviewed were starting to interpret sustainability as a systems approach. Those interviewed indicated that they were looking at sustainability more holistically, i.e., working with the supply chain both upstream and downstream to improve their environmental footprint.

Some of the companies interviewed were actually treating sustainability as a budget item recognizing that investment would likely be needed to truly become “sustainable”.

Although training personnel is an important consideration, most indicated they had to develop their own training programs since there is not a readily available trained pool of personnel or training programs in the marketplace for sustainability.

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Key Words: Sustainability, Plastic Packaging, Environmental.

**Table 1: Interview Responses**

Question	Response
<b>Q1: How do you or your company define sustainability?</b>	Carbon footprint, water, and solid waste.
	We believe in holistic approach-procedures, product lines, and distribution.
	A combination of economic, social, and environmental impacts.
	Doing things that do not impact the environment.
	Practices of using materials that creates current products

	without impacting the future.
<b>Q2: Do you have a Chief Sustainability Officer?</b>	Yes
	No. VP of R&D takes care of it
	Yes
	No. VP takes care of these things.
	No. Executive Team takes care of it.
<b>Q3: Does your company offer any training to the current employees about sustainability?</b>	Yes. Speech on design for sustainability, benefits of packaging.
	Yes. HR makes sure they train employees (internal and external) about recycling, how to handle energy utilities etc.
	Yes. The company has 7 key objectives and sustainability is one of them. For educating employees they send them to conference, circulate newsletter throughout the organization. Every time they have internal meeting, Sustainability is in agenda.
	Not really.
	No training but we definitely try to make them aware by raising sustainability issues during meetings.
<b>Q4: While hiring new employees are there any 'sustainability' criteria?</b>	No
	No
	No
	No
	No
<b>Q5: What is your current sustainability strategy?</b>	Specific target is to increase recycling. No figures though.
	No specific game plan. They are doing all they can.
	Internal: Minimizing footprint; External: provide solutions to all consumers no matter what their sustainable priorities are.
	Active participation in supply chain for recycling.
	We don't have any specific strategy, but we are part of an industry wide initiative. We just make sure that clients are satisfied.
<b>Q6: How does the upper level management communicates the</b>	We communicate through presentations, newsletter, and memos
	We communicate through

<b>'sustainability' strategies to the lower level employees?</b>	middle management using newsletter, memos.
	Newsletters.
	Information sharing through presentations.
	Presentations, periodicals etc.
<b>Q7: Is there any specific budget allocation for 'sustainability'?</b>	\$250,000-300,000.
	No. Things are changing so fast. It is very difficult to predict and allocate any specific budget at this time.
	No
	No
<b>Q8: Are you using any tools to measure sustainability?</b>	Yes. Metrics, measuring energy, carbon footprint, LCA, number of tools compass.
	Yes. We are using software to measure electricity, water usage and output. (he forgot the name of the software.....he will let us know if we email him)
	No specific tools, we just collect data.
	No, we don't need to measure sustainability.
	Not yet, not independently. We are on a developing stage.
	We are the leader
	We are the leader
	We are the leader
<b>Q9: Where do you stand relative to your competitors in terms of sustainability?</b>	In terms of recycling 'we are leader'. In general we are engaged.
	We are doing our best. For example: We have another business unit where solid waste of another unit is used there.
<b>Q10: Is your company partnering with others on sustainability issues/products/energies?</b>	Yes, recycling.
	We work with the overall supply chain.
	Yes, we are partnering with upstream suppliers and customers. "It's the only way to do it".
	Yes, we are partnering with a company for LCA.
	No. (Our internal efforts: buildings less than 10 years old, lighting initiative, heat generation).
<b>Q11: Do you have sustainable global</b>	Started to look at it. Using SEDEX, CDP.

<b>sourcing and supply chain strategy?</b>	No
	No
	No
	No
<b>Q12: How do you monitor environmental regulations that would impact your business?</b>	Industry groups.
	Attending conference, the Director of safety updates new requirement every week.
	Keep track of government legislation and industry happenings.
	Legally- Attorneys
	Conferences, discussions.
<b>Q13: Do you have any specific performance goals set in this area?</b>	Not specific, but lowering environmental impact is the goal.
	Nothing specific as the trends are so unpredictable. We are making prompt decisions.
	No, not yet. Because different customers have different 'sustainable' demands, we are still choosing the best one to focus on as it is not feasible to do them all at this point.
	No.
	Not yet.